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Fishery Leaflet 36

Washington 25, D. C. Reissued June 1948

THE FOOD VALUE OF FISH AND SHELLFISH

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About three billion pounds of fish and shellfish are taken commercially for food in the United States and Alaska. These are sold under some 150 different names for salt-water fish, 60 for fresh-water fish, and 20 for shellfish. Some species are sold under one or more local names, but even so there are many varieties of fish and shellfish available on the market.

Most homemakers do not realize that such a wide variety is available, and they are likely to limit their purchases to only a few species. The popular varieties are usually those which can be caught over a long season, possess excellent shipping and storage qualities, or are particularly suitable for canning and processing. There are, of course, differences in size, color, flavor, and texture which make some varieties of fish and shellfish more desirable than others for the table. Most of the lesser-utilized varieties, however, will prove satisfactory for the preparation of many types of dishes.

Protein, fat, mineral matter, and vitamins are the food elements in fishery products. The protein amounts to about 18 percent, the fat from 1 to 20 percent depending on the species, and the mineral content about 1 percent of the edible part of fresh or frozen fish, or shellfish. Canned and preserved fish usually have part of the water removed in processing; therefore, the protein, fat, and mineral matter content will be higher in proportion to total weight. The vitamin content varies so much that an average value cannot be given for processed fish.

One method of determining the nutritive value of the protein of fishery products is to carry out feeding studies with laboratory animals. So far, numerous experiments have shown that the nutritive value of fish products is equal or superior to that of the beef used for comparison. Furthermore, it was found that the cooking methods ordinarily used by the homemaker do not decrease the nutritive value of the protein. Feeding studies have also shown that the protein is from 85 to 95 percent digestible.

Another method for estimating the nutritive value of the protein is to determine the amino acid content. The various proteins are made up of different combinations of some 20 amino acids. The need for protein by animal life, for building muscle tissue and for other purposes, is more specifically a need for certain amino acids than for the total protein as a unit. Ten of

these amino acids must each be supplied in the diet, in amounts sufficient for maintenance of body tissues, but the others that are needed can be manufactured by body processes from fragments of those which are not essential. Less is known about the requirements for growth, pregnancy and lactation. The few chemical studies which have been reported show that the proteins from fish contain the essential amino acids in proportions permitting economical utilization of the protein.

In general, fish and shellfish are an excellent source of high grade animal protein. One serving portion a day of a fishery product will supply the animal protein necessary for properly balancing the less efficient cereal and vegetable proteins in the daily diet.

The fat gives an appetizing flavor to the cooked dish and, together with part of the protein, is utilized by the body to produce energy in the form of heat or motion. This is a less important nutritive use of fishery products, since many foodstuffs, particularly the starchy ones, can be used as sources of energy.

The fatter fish are usually broiled, or baked, so part of the fat is removed in cooking. The lean fish are broiled, baked, or fried with added fat from other sources to give flavor. Steaming, simmering, or boiling does not ordinarily change the fat content of the fish. Oil in cans of "natural-pack" fish is a valuable source of vitamins A and D, and should be used in the preparation of dishes. The vegetable oils used in cans of tuna, sardines, etc., can be used as a source of calories, or may be discarded if these fishery products are to be included in reducing diets.

The mineral matter content of fish fillets is usually comparable to that in muscle meats except that fish contain more iodine. Shellfish are a reasonably good source of calcium, phosphorus, iron, copper, and iodine.

In the canning of fish, the bones are softened and they may be eaten as a source of calcium and phosphorus. The liquid in "natural-pack" canned fishery products should be mixed with the flesh in preparation for cooking since it contains soluble minerals, and protein.

Very few assays have been conducted to determine the vitamin content of fishery products prepared for the table. An average serving portion of salmon and mackerel will supply from 150 to 700 international units of vitamin A, and 50 to 200 international units of vitamin D. The lean fish supply but little of the fat-soluble vitamins.

Of the water-soluble vitamins, an average serving portion of canned fishery products will supply from .05 to .1 milligram of thiamine, and other cooked fish will supply from .1 to .3 milligram of thiamine (vitamin B_1). Each serving portion will also supply from .1 to .4 milligram of riboflavin (vitamin B_2), and from 2 to 7 milligrams of niacin.

Fishery products can be included in the daily diet with full confidence that they supply high quality food from the nutritional standpoint, and satisfying flavor and texture.

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(Revised Sept. 1946)

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